THE PROCESS HAZARDS REVIEW PROGRAM AT THE SAVANNAH RIVER SITE

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Presentation Outline

- ***Introduction to the SRS PHR Program.***
- ***Purpose of the PHR.***
- ***The PHR Team.***
- ***Types of PHRs at SRS.***
- ***PHR Techniques used at SRS.***
- ***PHR Report Structure and Format.***

Introduction

- ***The Savannah River Site is located in South Carolina and covers approximately 400 square miles.***
- ***SRS has approximately 400 facilities with over 13,000 employees.***

Vitrification Plant
Reactors
Analytical Laboratories
Incinerators
Disposal Areas

Chemical Separations
Tritium Facilities
Ecology Laboratories
Assorted Research Projects
Treatment Facilities

Introduction - Cont.

The Savannah River Site formed the Process Safety Management Committee in 1979.

- ***Reviews and recommends policies and criteria concerning management of process hazards through the site PSM Manual. The cornerstone of the PSM Manual is the Process Hazards Review (PHR).***
- ***Provides training on PHRs to approximately 300 SRS employees each year.***
- ***Audits PHRs completed by site facilities. SRS completes approximately 100 - 120 PHRs in a typical year.***

Introduction - Cont.

- ***Site PSM Committee***
  - ***Committee Chairman***
  - ***Site PHR Coordinator***
  - ***ESH&QA***
  - ***Divisional Representatives***
- ***Division Subcommittees***
- ***PHR Review Teams***

Purpose of the PHR

- ***The principle objective of the PHR is to provide a systematic review of each process having the potential to result in a catastrophic accident in order to minimize injuries and property damage resulting from process-related hazards.***
- ***Employees also gain a greater understanding of how a process operates and the hazards associated with the process.***

Types of PHRs at SRS

- ***Screening PHR***
  - ***An initial review performed on any proposed process or modification to an existing process.***
  - ***Performed by an experienced process engineer.***
  - ***Determines need for formal PHR.***
- ***Preliminary PHR***
  - ***Performed prior to the design phase and is a comprehensive review of the new process or process modification.***
  - ***Performed by one or more experienced process engineers.***
  - ***Identifies general hazards and design options.***

Types of PHRs - Cont.

- ***Design PHR***
  - ***Performed by the design agency during the design phase.***
  - ***Usually the most extensive review conducted.***
  - ***Looks at system interactions.***
- ***Proportional PHR -***
  - ***Performed prior to startup of process modification or new facility.***
  - ***Addresses action items from previous PHRs and ensure that the procedures, instruments, equipment and administrative controls are in place.***
  - ***Evaluates any final design changes.***

Types of PHRs - Cont.

- ***Periodic PHR***
  - ***Performed on existing processes at intervals of three to seven years, depending upon the complexity of the process.***
  - ***Performed by team of process personnel.***
  - ***Evaluation of new hazards introduced since previous PHR.***
  - ***Evaluation of effect of small changes on overall process.***
  - ***Evaluation of changes to facility mission.***

Accident Criteria

- ***Personnel Safety***
  - ***Life threatening injury or permanent disability***
  - ***Radiation Exposure***

    5 Rem Onsite

    0.5 rem Offsite
  - ***Toxic Material Exposure***

    ERPG-2 Onsite

    ERPG-1 Offsite

Accident Criteria - Cont.

- ***Loss of equipment or facilities greater than $1,000,000. This includes cleanup costs and any associated fines.***

- ***Loss of production greater than six months.***

- ***Other as specified by the PSM Subcommittee representative.***

Action Items and Recommendations

- ***Action Item - Written if an Accident Criteria can be exceeded and if adequate protection is not already in place. The action item must be implemented by the facility prior to startup.***

- ***Recommendation - Written if the Accident Criteria will not be exceeded, or if the Accident Criteria are exceeded, adequate protection is already in place. A recommendation must be addressed by the facility.***

The PHR Team

- ***Consists of two to seven members selected for their working knowledge of the process.***
- ***Team Leader is appointed by management.***
- ***Team uses outside specialists when required.***
- ***At least one member must be trained in the PHR methodology being used.***

PHR Techniques

- ***Techniques used by PHR teams***
  - ***What-If /Checklist***
  - ***HAZOP***
  - ***FMEA***
- ***Techniques used by safety specialists***
  - ***Fault Tree***
  - ***Event Tree***
  - ***Decision Tree***

The PHR Report

- ***Introduction - Brief description of new process or process change.***
- ***Summary - List of Accident Criteria exceeded***
- ***Review Details - list of Action Items and Recommendations.***
- ***Next Scheduled Review Date (3-7 years).***

The PHR Report - Cont.

- ***Contributors***
  - ***Team members***
  - ***Consultants***
  - ***Vendors***
- ***References***
- ***Appendices***
  - ***Worksheets***
  - ***Chemical lists***
  - ***Equipment lists***
  - ***Calculations***
  - ***Process Description***
  - ***MSDS***

Conclusions

- ***The PHR is used for DOE-STD 3009, DOE-STD-3011, PSM, and RMP documentation.***
- ***The PHR is an excellent educational process for employees.***
- ***The PHR reduces facility costs by identifying hazards while still in the design or startup stages.***
- ***The PHR process can be used throughout the lifetime of the facility***